

Notice of Allowability

Application No.

10/777,117

Examiner

Michael Trinh

Applicant(s)

MONOE ET AL.

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed 2/13/2004.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ The drawings filed on 13 February 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/13+9/29+11/19/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Michael Trinh
Primary Examiner

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DETAILED ACTION

*** This office action is in response to filing of the application on February 13, 2004.

Claims 1-20 are pending.

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

IN THE SPECIFICATION: (Just for inserting Table 1 from Appendix to the specification)

** Specification page 13, line 10, replace "[Table 1]" with

Table 1

	etch rate (Å/min)								selection ratio							
	W		TaN		SiO ₂		W/TaN									
	AVE	p.n.u	AVE	p.n.u	AVE	p.n.u	AVE	p.n.u								
condition 1	700	4	2.0	24			12	24	4822	8.2%	1015	8.0%	301	7.5%	4.77	14.8%

	ICP	Bias	Press	SF ₆	CF ₄	BCl ₃	Cl ₂	O ₂	Ti		TaN		SiO ₂		Ti/TaN	
	W	W	Pa	sccm	sccm	sccm	sccm	sccm	AVE	p.n.u	AVE	p.n.u	AVE	p.n.u	AVE	p.n.u
condition 2	500	10	1.9		0		80	0	129	49.8%	835	50.8%	41	27.4%	0.16	64.5%
condition 3	700	10	1.9		0		80	0	490	79.3%	1087	66.3%	37	41.0%	0.47	89.2%
condition 4	500	40	1.9		0		80	0	(9600) ※1		2755	9.0%	225	7.7%	(3.89)	-
condition 5	500	10	1.9		10		70	0	(12000) ※2		775	26.0%	224	9.5%	(20.58)	-
condition 6	500	10	1.9		10		65	5	545	69.9%	257	52.6%	230	9.7%	2.08	49.2%
condition 7	500	10	1.9			65	10	8.5	6566	8.6%	251	120.7%	64	10.9%	38.25	92.0%
condition 8	500	10	1.9			70	10	0	3534	16.6%	220	67.5%	123	10.0%	25.03	145.1%
condition 9	500	10	1.9			35	40	8.5	4903	79.2%	161	65.8%	10	126.3%	63.82	180.7%
condition 10	700	10	1.9			65	10	8.5	7315	11.8%	211	47.6%	90	11.7%	37.57	50.8%

confirmation of reproducibility									Ti		TaN		SiO ₂		Ti/TaN	
condition 7 (again)	500	10	1.9			65	10	8.5	5082	7.2%	102	30.4%	64	10.9%	50.91	27.3%
condition 11	500	10	1.9			60	15	8.5	5929	6.3%	125	25.5%	56	15.9%	48.71	30.5%

※1 no step at the stage of etching for 15 seconds (=not etched)
no deposited metal 8000 Å left at the stage of etching for 50 seconds
※2 no deposited metal 8000 Å left at the stage of etching for 40 seconds

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Allowable Subject Matter

2. Claims 1-20 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter:

The references of record including , alone or in combination, do not anticipatively disclose each and every aspect of the method for manufacturing a semiconductor device, or fairly make a prima facie obvious case of the claimed method, in combination with other processing claimed limitations as recited in base claims, the inclusion of forming a first conductive layer over the gate insulating film formed on the semiconductor film; forming a second conductive layer on the first conductive layer; etching the first conductive layer and the second conductive layer to form a first conductive-layer pattern; selectively etching the second conductive layer in the first conductive-layer pattern with plasma of boron trichloride, chlorine, and oxygen to form a second conductive-layer pattern; and forming a first impurity region and a second impurity region in the semiconductor layer, as recited in base claims 1-2, or doping the semiconductor layer with an impurity element through the first conductive layer in the second conductive layer pattern to form an LDD region, as recited in base claims 13-14.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F, 9:00 Am to 5:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone numbers for the organization where this application proceeding is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-17



Michael Trinh
Primary Examiner